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ELAPHOGLOSSUM WAWRAE (Luer.) C. Chr.



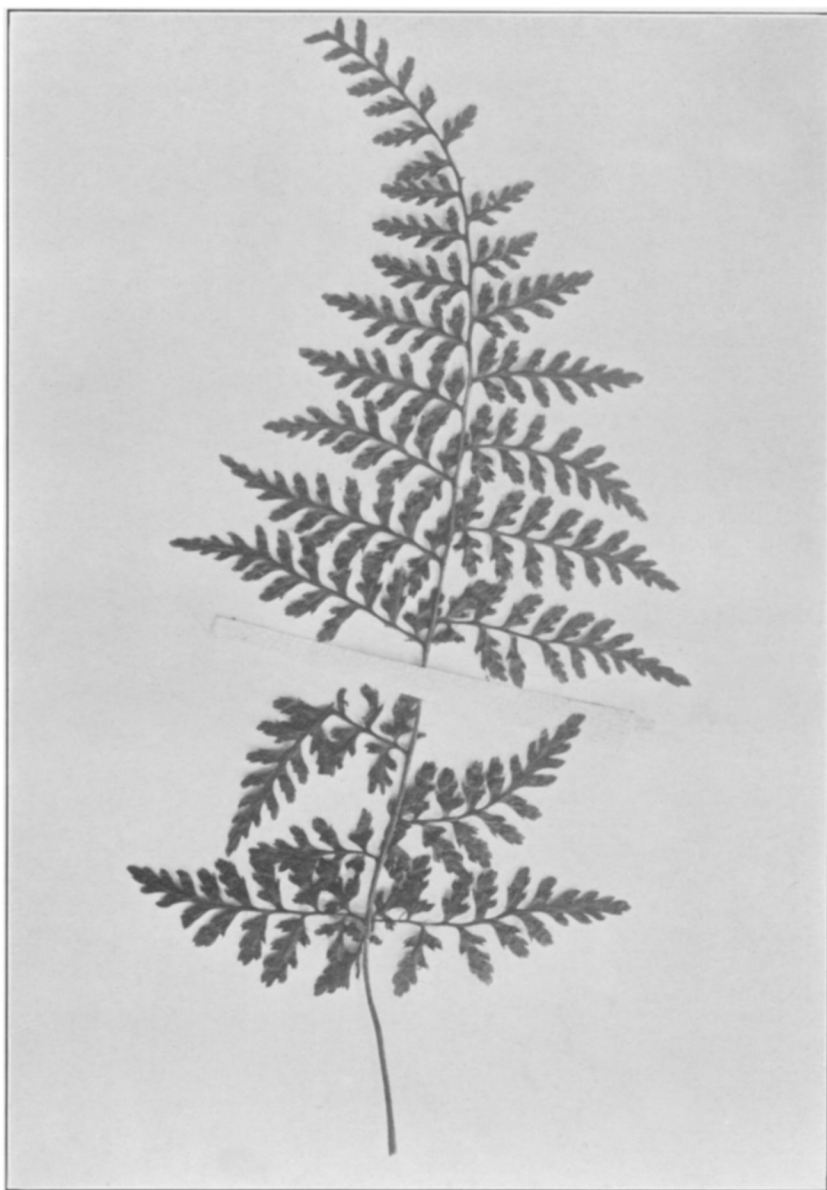
SCHIZOSTEGE LYDGATEI Hilleb.  
Apex and basal pinna



**DRYOPTERIS FUSCO-ATRA (Hilleb.) W. J. Robinson**



DYOPTERIS NUDA UNDERW.



*DRYOPTERIS PARVULA* W. J. Robinson

BULLETIN  
OF THE  
TORREY BOTANICAL CLUB

DECEMBER 1912

A taxonomic study of the Pteridophyta of the Hawaiian Islands—II

WINIFRED J. ROBINSON

(WITH PLATES 40-44)

5. POLYPODIACEAE

Plants various in habit. Rootstock erect or creeping; leaves circinate in veneration, blades simple to quadripinnate; sporangia covering the lower surface in a uniform layer or arranged in linear, roundish, or oval sori; these indusiate or non-indusiate; sporangia stalked; annulus incomplete.

Sporangia scattered over the under surface of the leaf blade in a uniform layer.

1. *Elaphoglossum*.

Sporangia in definite sori.

Sori marginal or submarginal.

Indusium present.

Sori continuous or interrupted, indusium formed of the more or less modified leaf margin.

Indusium opening inward.

Sporangia arising from a continuous veinlike receptacle, connecting the ends of the veins.

Indusium single.

2. *Pteris*.

Indusium double.

3. *Pteridium*.

Sporangia arising from the unconnected ends of veins.

Leaf margin continuously reflexed in fertile leaflets.

Veins free.

4. *Pellaea*.

Veins anastomosing.

5. *Doryopteris*.

- Separate lobes of leaf margin  
 reflexed as indusia.  
 Leafstalks black, shining. 6. *Adiantum*.  
 Leafstalks brownish, dull.  
 Sori distinct in sinus  
 of leaf. 7. *Hypolepis*.  
 Sori crowded. 8. *Schizostege*.
- Indusium opening outward.  
 Pinnæ strongly developed on anterior side.  
 Sori transverse on the expanded tips of free or anastomosing veins, segments dimidiate or cuneate. 9. *Diellia*.  
 Sori on the expanded tips of free veins with no intramarginal vein, pinnæ only slightly developed on posterior side. 10. *Odontoloma*.  
 Pinnæ developed on both sides of the midrib, though not equally.  
 Indusium attached only at the base; pinnæ jointed to the midrib. 11. *Nephrolepis*.  
 Indusium attached on three sides.  
 Ultimate segments cuneate. 12. *Odontosoria*.  
 Ultimate segments not cuneate but toothed or lobed. 13. *Microlepia*.  
 Indusium absent; sporangia sunken in a marginal groove. 14. *Vittaria*.  
 Sori dorsal, with or without indusia.  
 Indusium partly inferior, hood-shaped. 15. *Filix*.  
 Indusium superior or wanting.  
 Indusium wanting.  
 Sporangia following the veins.  
 Under surface covered with a waxy powder. 16. *Ceropteris*.  
 Under surface not covered with a waxy powder. 17. *Coniogramme*.  
 Sporangia in definite, roundish sori.  
 Leaves non-articulate. 18. *Dryopteris* (in part).  
 Leaves articulate.  
 Veins free. 19. *Polypodium*.  
 Veins anastomosing with free included veinlets.



- Veins indistinct, leaf blade simple. 20. *Phymatodes*.
- Veins distinct, leaf blade pinnatifid. 21. *Phlebodium*.
- Indusium present.
- Sori roundish or oval.
- Veins free.
- Indusium circular, attached in the center. 22. *Polystichum*.
- Indusium reniform or orbicular, attached at the side or in the sinus. 18. *Dryopteris* (in part).
- Veins anastomosing.
- Veins anastomosing regularly to form one or more areolae, with free included veinlets. 23. *Cyrtomium*.
- Veins anastomosing copiously, with few included veinlets. 24. *Tectaria*.
- Sori elongate, on the veins or crossing them.
- Leaf blades simple. 25. *Neottopteris*.
- Leaf blades pinnate to quadripinnate.
- Veins free; sori oblique to the midrib.
- Sori simple on the outer side of the veinlet or crossing it.
- Sori usually straight. 26. *Asplenium*.
- Sori usually curved, often crossing the veinlet. 27. *Athyrium*.
- Sori double, usually opening outward. 28. *Diplazium*.
- Veins anastomosing; sori parallel to the midrib.
- Sori continuous. 29. *Sadleria*.
- Sori interrupted. 30. *Doodia*.

# 1. ELAPHOGLOSSUM Schott, Gen. Fil. *pl.* 14. 1834

Mostly tropical plants found growing upon rocks or as epiphytes in the forests. Rootstock erect or creeping; leaves articulate, simple; blades of fertile leaves usually narrower than those of sterile leaves; veins usually free, occasionally anastomosing; sporangia covering the lower surface of the leaf, non-indusiate.

Type species: *Elaphoglossum conforme* (Sw.) Schott.

Veins free.

Leaves densely covered with brown scales. *E. hirtum*.

Leaves smooth or bearing minute scattered scales.

Rootstock slender, 1-5 mm. in diameter.

Leaf blades oblong-lanceolate, acuminate. *E. micradenium*.

Leaf blades linear or linear-oblong-lanceolate, acute or somewhat obtuse. *E. acmulum*.

Rootstock stout, 2-4 cm. in diameter; leaf oblong-lanceolate, obtuse. *E. Wawrae*.

Veins not free.

Veins anastomosing freely throughout. *E. reticulatum*.

Veins united by a marginal vein. *E. gorgonium*.

ELAPHOGLOSSUM HIRTUM (Sw.) C. Chr. Ind. Fil. 308. 1905

*Acrostichum hirtum* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 10. 1801.

*Acrostichum squamosum* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 11. 1801.

Not Cav.

*Acrostichum vestitum* Lowe (*paleaceum* in plate); Hook. & Grev.

Ic. Fil. 2: 235. 1831. Not Schl. & Cham. Linnaea 5: 605. 1830.

*Elaphoglossum squamosum* J. Sm. Jour. Bot. Hook. 4: 148. 1841.

*Elaphoglossum vestitum* J. Sm. Ferns Brit. & For. 106. 1866.

*Acrostichum micans* Mett. in Kuhn, Linnaea 36: 50. 1869.

TYPE LOCALITY: Azores (?)

DISTRIBUTION: Exposed ridges at 900-1,200 m. elevation, also on banks of streams in woods, tropical countries.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* C, N; *Robinson* 272 V; 274 V; 283 V; Maui, *Lichtenthaler* N; *Heller* 2688 C, N; Hawaiian Islands, *Baldwin* 99 C, N; *Hillebrand* C; *Lindley* C; *Miss Sessions* C; ex Herb. John Donnell Smith N.

The description of *E. hirtum* by Swartz in Jour. Bot. Schrad. 1800<sup>2</sup>: 10. 1801 is inadequate but is amplified in Syn. Fil. 194. 1806.

ELAPHOGLOSSUM MICRADENIUM (Fée) Moore, Ind. Fil. 12. 1857

*Acrostichum micradenium* Fée, Mém. Foug. 2: 43. 1845.

*Elaphoglossum nitidum* Brack. Fil. U. S. Expl. Exp. 70. 1854.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: On rocks and trees from 300 m. elevation upwards; Hawaiian Islands.

ILLUSTRATIONS: Fée, Mém. Foug. 2: pl. 8, f. 1. 1845; Brack. Fil. U. S. Expl. Exp. pl. 9, f. 3. 1854.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; Maui, *Lichtenthaler* N; Oahu, *Robinson* 49 V; 75 V; 110 V; *Safford* 875 N; Kauai, *Heller* 2621 C, N; Hawaiian Islands, *Baldwin* 97 C, N; *Hillebrand* C; *Wilkes Expedition* C.

ELAPHOGLOSSUM AEMULUM (Kaulf.) Brack. Fil. U. S. Expl. Exp.  
71. 1854

*Acrostichum aemulum* Kaulf. Enum. 63. 1824.

*Olfersia aemula* Presl, Tent. Pterid. 235. 1836.

*Acrostichum Helleri* Underw. in Heller, Minn. Bot. Stud. 1: 771.  
1897.

TYPE LOCALITY: Oahu.

DISTRIBUTION: On trees at 900–1,200 m. elevation; Tropical America, Africa, India, Malaysia, and Australia.

ILLUSTRATION: Underw. in Heller, Minn. Bot. Stud. 1<sup>2</sup>: 42.  
1897.

SPECIMENS EXAMINED: Hawaii, *Robinson*; Oahu, *Chamisso* B; *Forbes* BM; Kauai, *Heller* 2709 C, N; *Kuntze* 23037 C; Hawaiian Islands, *Gaudichaud* C.

ELAPHOGLOSSUM WAWRAE (Luerissen) C. Chr. Ind. Fil. 318. 1906  
*Elaphoglossum aemulum* Brack. Fil. U. S. Expl. Exp. 71. 1854.

Not Kaulf. Enum. Fil. 63. 1824.

*Acrostichum Wawrae* Luerissen, in Wawra, Flora 58: 420. 1875.

TYPE LOCALITY: Kauai.

DISTRIBUTION: In forests and on dry shaded rocks at 1,200 m. elevation; common; Hawaiian Islands.

ILLUSTRATION: PLATE 40.

SPECIMENS EXAMINED: Hawaii, District of Puna, *Wilkes Expedition* N; District of Waimea, *Wilkes Expedition* N; Mauna Loa, above 2,400 m., *Wilkes Expedition* N; Maui, *Lichtenthaler* N; *Mann & Brigham* N; *Robinson* 309 V; 315 V; 355 V; Kauai, *Forbes* 530 BM; *Heller* 2808 C, N; Hawaiian Islands, *Bailey* C; *Baldwin* 98 C, N; *Wilkes Expedition* C.

Brackenridge named his specimens of *Elaphoglossum Wawrae* *E. aemulum* and gave Kaulfuss's description of *Acrostichum aemulum* (Enum. 63. 1824), with slight changes, in his report, transferring the species from *Acrostichum* to *Elaphoglossum* (Brack.

Fil. U. S. Expl. Exp. 71. 1854). However, his specimens in the U. S. National Herbarium at Washington do not correspond with Kaulfuss's description of *A. aemulum* in dimensions or in other characters. The series of specimens noted above seems to represent but one species as indicated by the texture, uniform punctuations, and revolute margins of the leaves, and by the oblong-lanceolate scales of the rhizome. The dimensions of the leaves are fairly constant with the exception of a few plants, as *Baldwin 98* and *Wilkes Expedition*, Hawaii, District of Puna, which are smaller than the others.

ELAPHOGLOSSUM RETICULATUM (Kaulf.) Gaud. Voy. Bonite Bot.  
1846

*Acrostichum reticulatum* Kaulf. Enum. 64. 1824.

*Acrostichum crassifolium* Gaud. Voy. Freyc. Bot. 303. 1828.

*Hymenodium crassifolium* Fée, Mém. Foug. 2: 91. 1845.

*Anetium reticulatum* Presl, Epim. 176. 1849.

*Hymenodium reticulatum* Moore, Ind. Fil. 19. 1857.

TYPE LOCALITY: Oahu, Chamisso collector.

DISTRIBUTION: On trunks of trees and on rocks, common; Hawaiian Islands.

ILLUSTRATIONS: Fée, Mém. Foug. 2: pl. 63. f. 1. 1845; Gaud. Voy. Bonite Bot. pl. 79. f. 1-4. 1846.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; Oahu, *Heller 2114* C, N; *Mann & Brigham 182* N; *Robinson 27* V; *106* V; *114* V; Kauai, *Heller 2567* C, N; *Robinson 436* V; Hawaiian Islands, *Baldwin 101* C; *Hillebrand 112* C; *Wilkes Expedition* C; ex Herb. John Donnell Smith N.

ELAPHOGLOSSUM GORGONIUM (Kaulf.) Brack. Fil. U. S. Expl. Exp.  
74. 1854

*Acrostichum gorgonium* Kaulf. Enum. 63. 1824.

*Olfersia gorgonea* Presl, Tent. Pterid. 235. 1836.

*Aconiopteris obtusa* Fée, Mém. Foug. 2: 80. 1845.

*Olfersia obtusa* Moore, Ind. Fil. 1: 17. 1857.

*Aconiopteris gorgonea* J. Sm. Hist. Fil. 128. 1875.

*Acrostichum pellucido-marginatum* Christ, Verh. Nat. Ges. Basel  
11: 255. 1895.

TYPE LOCALITY: Oahu.

DISTRIBUTION: On ground in wet woods at 600–700 m. elevation, Hawaiian Islands, Society Islands.

ILLUSTRATION: Fée, Mém. Foug. 2: *pl.* 41. 1845.

SPECIMENS EXAMINED: Hawaii, *Mann & Brigham* 286 N; Maui, *Lichtenthaler* N; *Robinson* 303 V; Oahu, *Heller* C, N; *Robinson* 4 V; 48 V; *Wilkes Expedition* N; Kauai, *Heller* C; *Robinson* 833 V; Hawaiian Islands, *Baldwin* 100 C; *Miss Sessions* C; ex Herb. Mt. Holyoke College C.

## 2. PTERIS L. Sp. Pl. 1073. 1753

A cosmopolitan genus of various habit. Rootstock usually creeping; leafstalk articulate; blades variously divided; sori marginal, linear, continuous upon a slender receptacle, connecting the tips of the free veins, indusiate.

Type species: *Pteris arborea* L.

Leaf blade broadly oblong, bipinnate; sterile pinnae broader than fertile pinnae, segments of former irregularly crenulate, segments of latter entire; midrib not winged.

*P. excelsa.*

Leaf blade ovate to ovate-oblong, bipinnate to quadripinnate; midrib winged throughout or terminal pinnae decurrent.

Midrib winged toward the apex, the terminal pinnae decurrent; leaf pinnate; pinnae linear-lanceolate, simple, or the lowest pair often bi-tripartite.

*P. cretica.*

Midrib winged throughout; leaf quadripinnate; pinnae varying from linear-lanceolate and entire to oblong and crenate-dentate.

*P. irregularis.*

PTERIS EXCELSA Gaud. Voy. Freyc. Bot. 388. 1829

*Pteris terminalis* Wall. Cat. no. 101. 1828 (nomen).

*Pteris owahuensis* Presl, Tent. Pterid. 145 (nomen). 1836.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In damp gulches at elevations of 600–900 m.; Northern India, Malaysia, and Fiji Islands.

ILLUSTRATION: Hook. Sp. Fil. 2: 136. 1846.

SPECIMENS EXAMINED: Hawaii, *Robinson* 226 V; 235 V; Maui, *Bailey* C; *Robinson* 306 V; Oahu, *Forbes* BM; *Hillebrand* 407 V; *Robinson* 104 V; Kauai, *Heller* 2649; Hawaiian Islands, *Baldwin* 18; *Wilkes Expedition* 11 C; *Miss Sessions* C.

PTERIS CRETICA L. Mant. 130. 1767

*Pteris nervosa* Thunb. Fl. Jap. 332. 1784.

*Pteris serraria* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 65. 1801.

*Pteris pentaphylla* Willd. Sp. Pl. 5: 362. 1810.

*Pteris triphylla* Mart. & Gal. Mém. Acad. Brux. 15: 51. pl. 14. f. 1. 1824.

*Pteris scabripes* Wall. Cat. no. 94. 1828.

*Pteris melanocaulon* Féc, Mém. Foug. 7: 31. pl. 19. f. 1. 1857.

*Pteris Treacheriana* Baker, Jour. Bot. 17: 65. 1879.

*Pteris lomarioides* Colenso, Trans. N. Z. Inst. 13: 380. 1881.

TYPE LOCALITY: Crete.

DISTRIBUTION: On ground and on trees, tropical countries.

ILLUSTRATIONS: Mart. & Gal. Mém. Acad. Brux. 15: 51. pl. 14. f. 1. 1824; Féc, Mém. Foug. 7: 31. pl. 19. f. 1. 1857.

SPECIMENS EXAMINED: Maui, *Bailey* C; *Bishop* B; *Hillebrand* B; Oahu, *Heller* 2782 C; *Hillebrand* B; *Robinson* 22 V; 25 V; 42 V; Kauai, *Knudsen* 39 B; Hawaiian Islands, *Baldwin* 19 B, C.

#### PTERIS IRREGULARIS Kaulf. Enum. 189. 1842

*Pteris alata* Gaud. Voy. Freyc. Bot. 391. 1829.

*Pteris regularis* E. Bailey, Haw. Ferns 26. 1883.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In woods and shady gulches 300–900 m. elevation; Hawaiian Islands.

ILLUSTRATION: Gaud. Voy. Freyc. Bot. pl. 19. 1829.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B, K; Maui, *Bailey* C; *Hillebrand* B; *Wilkes Expedition* C; Oahu, *Bennett* 85 B; *Chamisso* C; *Forbes* BM; *Gaudichaud* B; *Heller* 2335 C; *Hillebrand* B; 79 B; *Lindley* K; *Macrae* B; *Mann & Brigham* 162 C; *Meyen* B; *Nuttall* K; *Robinson* 12 V; 56 V; 61 V; 65 V; 116 V; Kauai, *Knudsen* 40 B; 41 B; 69 B; Hawaiian Islands, *Baldwin* 17 B, C; *Douglas* 31 K; *Gaudichaud* 184 B; *Hillebrand* K; *Knudsen* 29 B; 42 B; *Miss Sessions* C; *Wilkes Expedition* C.

Bailey (Haw. Ferns 25. 1883) believed that two species had been confused under the name *P. irregularis* and sought to clear up the difficulty by describing *P. regularis*. The variations shown by leaves growing upon the same plant permit placing the several forms in one species.

#### 3. PTERIDIUM Gleditsch, in Scop. Fl. Carn. 169. 1760

Rootstock wide-creeping; leaves distant, not articulate, triangular to deltoid-ovate, ternately compound; sorus linear, follow-

ing the vein which connects the tips of the otherwise free veins; indusium double, the outer formed from the incurved margin of the frond, the inner attached to the receptacle on the inner side and enclosed by the outer indusium, both ciliate at the margin.

Type species: *Pteris aquilina* L.

PTERIDIUM AQUILINUM (L.) Kuhn; v. Decken, Reisen Ost. Afr. Bot.

11. 1879

*Pteris aquilina* L. Sp. Pl. 1075. 1753.

*Cincinialis aquilina* Gled. Syst. Pl. 290. 1764.

*Asplenium aquilinum* Bernh. Jour. Bot. Schrad. 1799<sup>1</sup>: 310. 1799.

*Pteris psittacina* Presl, Del. Prag. 185. 1822.

*Pteris arachnoidea* Kaulf. Enum. 190. 1824.

*Allosorus aquilinus* Presl, Tent. Pterid. 153. 1836.

*Eupteris aquilina* Newman, Phytologist 2: 278. 1845.

*Paesia aquilina* Keyserl. Polyp. Cyath. Herb. Bung. 22. 1873.

*Ornithopteris aquilina* J. Sm. Hist. Fil. 298. 1875.

TYPE LOCALITY: Europe.

DISTRIBUTION: Common through tropics and North Temperate zones.

ILLUSTRATIONS: Diels, in E. & P. Nat. Pfl. 1<sup>4</sup>: 296. 1899; Waters, Ferns 93. 1903.

SPECIMENS EXAMINED: Hawaii, *Baldwin* 17; Mauna Loa, *Wilkes Expedition* C; Maui, *Bailey* 40 C; Kauai, *Heller* 2416 C; 40 C; Hawaiian Islands, *Baldwin* 20 C, N; ex Herb. John Donnell Smith 17.

In the Olinda woods at 1,300 m. elevation on Mt. Haleakala, Maui, plants of *Pteridium aquilinum* attain such size that it seems hardly possible that they are of the same species as the dwarfed, leathery, and resistant forms that grow upon the exposed rocks at from 2,000 m. to 3,000 m. elevation. Further study may show that they are distinct species, but for the present their differences must be considered ecological rather than taxonomic.

#### 4. PELLAEA Link, Fil. Sp. 59. 1841

Xerophilous plants, usually found upon rocks. Rootstock short, erect; leaves cespitose, articulate; blades consisting of 1 to 3 nearly uniform leaflets; sori marginal, borne upon the ends

of unconnected veins; indusium formed by the reflexed margin of the leaf.

Type species: *Pteris atropurpurea* L.

PELLAEA TERNIFOLIA (Cav.) Link, Fil. Sp. 59. 1841

*Pteris ternifolia* Cav. Desc. Pl. Dem. 266. 1802.

*Pteris peruviana* Poir. in Lam. Encyc. 5: 718. 1804. (Reduced to synonym in supplement.)

*Pteris subverticillata* Sw. Syn. Fil. 103. 1806.

*Allosorus ternifolius* Kunze; Klotzsch, Linnaea 20: 339. 1847.

?*Pellaea Weddelliana* Fée, Mém. Foug. 8: 4. 1857.

*Cheilanthes ternifolia* Moore, Ind. Fil. 255. 1861.

*Nothochlaena ternifolia* Keyserl. Polyp. Cyath. Herb. Bung. 30. 1873.

TYPE LOCALITY: Peru.

DISTRIBUTION: At elevations of 1,500 m. in dry exposed places in the mountains, Chile to Texas; Hawaiian Islands.

ILLUSTRATIONS: Hook. & Grev. Ic. Fil. 2: pl. 126. 1829; Lowe, Ferns Brit. & Exot. 3: pl. 24b. 1857.

SPECIMENS EXAMINED: Hawaii, *Lichtenthaler* N; *Mann & Brigham* 262 N; *Safford* 884 N; *Wilkes Expedition* N; Maui, *Bailey* C; *Robinson* 312 V; Kauai, *Wilkes Expedition* C, N; Hawaiian Islands, *Baldwin* 15 C, N; *Lindley* C; *Moore* C; *Remy* 40 C; *Miss Sessions* C; ex herb. Kew Gardens C.

##### 5. DORYOPTERIS J. Sm. Jour. Bot. Hook. 3: 404. 1841

Rootstock short, erect; leaves cespitose, palmate or pedate, coriaceous; petiole black, polished; veins free or anastomosing, indistinct; sori marginal; indusium usually revolute with age.

Type species: *Pteris hastata* Raddi.

Leaf blades broadly deltoid; ultimate segments lanceolate.

*D. decipiens.*

Leaf blades ovate-cordate; ultimate segments linear.

*D. decora.*

DORYOPTERIS DECIPIENS (Hook.) J. Sm. Hist. Fil. 289. 1875

*Pteris pedata* Hook. & Arn. Bot. Beech. 107. 1832. Not Willd.

*Doryopteris pedata* Brack. Fil. U. S. Expl. Exp. 403. 1854.

*Pteris decipiens* Hook. Sp. Fil. 2: 209. 1858.

*Litobrochia decipiens* Moore, Ind. Fil. 342. 1862.



TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In crevices in rocks at 350 m. or more elevation, Hawaiian Islands.

ILLUSTRATION: Hook. Exot. Ferns *pl.* 34. 1858.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; Maui, *Bailey C*; *Lichtenthaler* N; Oahu, *Heller C*; *Mann & Brigham 136* N; *Wilkes Expedition* N; Hawaiian Islands, *Baldwin C*; *21 C*; *Hillebrand C*; *Moore C*; ex Herb. John Donnell Smith *67* N.

DORYOPTERIS DECORA Brack. Fil. U. S. Expl. Exp. 103. 1854

*Pteris decora* Hook. Sp. Fil. 2: 210. 1858.

*Litobrochia decora* Moore, Ind. Fil. 342. 1862.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: On exposed rocks at elevations of about 600 m., Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. *pl.* 13. *f.* 1. 1854.

SPECIMENS EXAMINED: Hawaii, *Mann & Brigham* N; *Wilkes Expedition* N; Maui, *Bailey C*; *Safford 882* N; Kauai, *Heller 2654* C, N; *Heller C*; Lanai, *Hillebrand* N; Hawaiian Islands, *Baldwin 22* C, N; *Wilkes Expedition C*.

## 6. ADIANTUM L. Sp. Pl. 1094. 1753

Delicate ferns, inhabiting moist, shady localities. Root-stock creeping or suberect; leafstalks slender, usually dark and lustrous, not articulate; blades pinnate to pinnately decompose or tripinnate; sori terminal upon the free forking veins within the reflexed lobes (indusia) of the leaflets.

Type species: *Adiantum Capillus-veneris* L.

ADIANTUM CAPILLUS-VENERIS L. Sp. Pl. 2: 1096. 1753

*Adiantum Capillus* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 83. 1801.

*Adiantum emarginatum* Bory; Willd. Sp. Pl. 5: 449. 1810.

*Adiantum Wattii* Baker, Jour. Linn. Soc. 18: 381. 1881.

*Adiantum Levingei* Baker, Ann. Bot. 5: 207. 1891.

TYPE LOCALITY: Southern Europe.

DISTRIBUTION: On ground or moist rocks in tropics and subtropics.

ILLUSTRATIONS: Hook. Brit. Ferns 41. 1861; Ettingsh. Farnkr. 44. *f.* 5. 11-17. 1865.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; Maui, *Bailey 41* C; Oahu, *Hitchcock* C; *Lichtenthaler* N; *Mann & Brigham* N; *Remy 241* B; *Robinson* V; *Safford 880* N; Kauai, *Forbes 306* BM; *Heller 2479* C, N; Hawaiian Islands, *Baldwin 14* B, C; *Moore* C; *Miss Sessions* C; *Wilkes Expedition 5* B.

## SPECIES INQUIRENDA

*Adiantum Bennettii* Carruth. in Seeman, Fl. Vit. 346. 1873

Hillebrand states that a specimen of this plant collected by Lieut. Strickland is in the herbarium of the British Museum, but it cannot be found there at the present time (1911).

7. HYPOLEPIS Bernh. Neues Jour. Bot. Schrad. 1<sup>2</sup>: 34.  
1806

Rootstock slender, wide-creeping; leaves pinnate to quadripinnate, herbaceous, hairy; leafstalk not articulate; veins free; sori borne in the sinuses of the segments; indusium formed by the small reflexed marginal lobe of the leaf.

Type species: *Lonchitis tenuifolia* Forst.

Leaf blade quadripinnate; petiole brownish at base, stramineous above;  
intervals on rootstock between leaves about 12 cm. *H. punctata*.  
Leaf blade bipinnate; leafstalk purplish red; intervals on rootstock between  
leaves 4-6 cm. *H. flaccida*.

HYPOLEPIS PUNCTATA (Thunb.) Mett. in Kuhn, Fil. Afr. 120.  
1868

*Polypodium punctatum* Thunb. Fl. Jap. 337. 1784. Not Swartz.

*Polypodium Paepigii* Kunze; Klotzsch, Linnaea 9: 50. 1834.

*Phegopteris punctata* Mett. Ann. Lugd. Bat. 1: 222. 1864.

*Phegopteris punctata* var. *glabra* Hilleb. Fl. Haw. Is. 362. 1888.

*Hypolepis tenuifolia* Underw. in Heller, Minn. Bot. Stud. 1: 782.  
1897.

*Nephrodium punctatum* Diels in E. & P. Nat. Pfl. 1<sup>1</sup>: 177. 1899.

TYPE LOCALITY: Japan.

DISTRIBUTION: Japan, China, Malaysia, Polynesia, Australia, New Zealand, Hawaiian Islands.

SPECIMENS EXAMINED: *Heller 2778* C.

*H. tenuifolia* (Forst.) Bernh. and *H. punctata* Mett. may be synonyms, though the term "arborescens" in Forster's original

description does not apply to the Hawaiian plant nor to the plants from Japan, China, and the South Pacific Islands, which are labeled "*Hypolepis tenuifolia*" in herbaria.

***Hypolepis flaccida* (Hilleb.) comb. nov.**

*Phegopteris punctata* var. *flaccida* Hilleb. Fl. Haw. Is. 563. 1888.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Hawaiian Islands.

SPECIMENS EXAMINED: *Baldwin 80 C, V.*

8. **SCHIZOSTEGE** Hilleb. Fl. Haw. Is. 631. 1888

Rootstock erect; leaves clustered, bipinnate at the base, bipinnatifid above, cyatheoid; sori oblong, marginal upon the T-shaped expansions of the veins, which occasionally anastomose; indusium coriaceous.

Type species: *Schizostege Lydgatei* Hilleb.

SCHIZOSTEGE LYDGATEI (Bak.) Hilleb. Fl. Haw. Is. 632. 1888

*Cheilanthes Lidgatei* Baker; Hook. & Baker, Syn. Fil. 475. 1874.

*Pteris Lydgatei* Christ, Farnkr. Erde 167. 1897.

TYPE LOCALITY: Oahu.

DISTRIBUTION: On ground, Oahu and Maui, Hawaiian Islands.

ILLUSTRATION: PLATE 41.

SPECIMENS EXAMINED: Maui, Gulch of Waihee, *Hillebrand B*; Oahu, Valley of Wailupe, *Lydgate & W. F. Hillebrand B*; Koolaulua Mts., between Punahua and Kaipapau, *Forbes BM*.

The specimens noted above are the only collections of this species that have been recorded, and an interval of about twenty-five years elapsed between the collections made upon Oahu.

The habit of *Schizostege* closely resembles that of *Pteris biaurita* L., but the relation is no closer than that of *Cheilanthes* to *Pteris* or of *Pellaea* to *Cheilanthes*.

*Schizostege* was a monotypic Hawaiian genus until Copeland (Philip. Jour. Sci. 1: Suppl. 2. 1906) described two Philippine species, *S. pachysora* and *S. calocarpa*, both of which he states resemble *Cheilanthes* to a greater extent than they resemble *Pteris*.

9. *DIELLIA* Brack. Fil. U. S. Expl. Exp. 217. 1854

Rootstock short; leaves cespitose; veins forking, uniting to form oblique areolae, free at the margin of the leaf or united by a transverse vein upon which the sporangia are borne; sori distinct; indusium linear-oblong, parallel to the margin of the leaf and opening outward.

Type species: *Diellia erecta* Brack.

Leaf blades pinnate.

Leafstalk and midrib smooth.

Pinnæ not more than 3 mm. broad, linear, zigzag from the alternate crenations of the margin. *D. centifolia*.

Pinnæ more than 3 mm. broad.

Leaf 8-10 cm. high, coriaceous; pinnæ rhomboid-ovate above, orbicular below. *D. pumila*.

Leaf more than 10 cm. high, chartaceous; pinnæ lanceolate, auricular. *D. erecta*.

Leafstalk and midrib scaly.

Pinnæ cut into cuneiform segments. *D. Alexandri*.

Pinnæ not cut into cuneiform segments.

Pinnæ lanceolate, acute, repand. *D. falcata*.

Pinnæ deltoid-lanceolate, caudate, laciniate. *D. laciniata*.

Leaf blades tripinnatifid to quadripinnate.

Blades tripinnatifid, 6-7-jugate. *D. Knudsenii*.

Blades quadripinnatifid, 40-50-jugate. *D. Mannii*.

***Diellia centifolia* (Hilleb.) comb. nov.**

*Lindsaya centifolia* Hilleb. Fl. Haw. Is. 621. 1888.

TYPE LOCALITY: Halemanu, Kauai.

DISTRIBUTION: Known from type locality only.

ILLUSTRATION: Diels in E. & P. Nat. Pfl. 1<sup>4</sup>: 211. f. 114D. 1899.

SPECIMENS EXAMINED: Kauai, *Knudsen* 35 (type) B.

It seems possible that *Diellia centifolia* may have arisen from a cross between *Diellia falcata* and *Diellia Alexandri*, by which it inherited the position of the sori from the former parent and the modified form of the pinnæ from the latter parent.

*DIELLIA PUMILA* Brack. Fil. U. S. Expl. Exp. 219. 1888

TYPE LOCALITY: Oahu.

DISTRIBUTION: In crevices of rocks, rare; Oahu, Hawaiian Islands.

SPECIMENS EXAMINED: Oahu, *Hillebrand* B; Nuuanu Valley, Oahu, *Hillebrand* B.

This species is represented at Kew by *Wilkes Expedition* 2, which is probably a cotype if not the type specimen.

DIELLIA ERECTA Brack. Fil. U. S. Expl. Exp. 218. 1854

TYPE LOCALITY: Mountain forest, Western division of Maui.

DISTRIBUTION: Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. *pl.* 31. *f.* 2. 1854.

SPECIMENS EXAMINED: Maui, *Baker* C; *Baldwin* B; *Hillebrand* B; Kauai, *Van Ingen* C; Hawaiian Islands, *Baldwin* 28 B; *Moore* B; ex Herb. Lindley C.

DIELLIA ALEXANDRI (Hilleb.) Diels in E. & P. Nat. Pfl. 14: 212. 1899

*Lindsaya Alexandri* Hilleb. Fl. Haw. Is. 622. 1888.

TYPE LOCALITY: Halemanu, Kauai.

DISTRIBUTION: Known from type locality only.

ILLUSTRATION: Diels in E. & P. Nat. Pfl. 14: 211. *f.* 114G, H. 1899.

SPECIMENS EXAMINED: Kauai, *Knudsen* B; Maui, *Baldwin* C, V; Hawaiian Islands, *Baldwin* 12 C.

DIELLIA FALCATA Brack. Fil. U. S. Expl. Exp. 219. 1854

TYPE LOCALITY: Kaala Mountains, Oahu.

DISTRIBUTION: On dry, open ridges, Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. *pl.* 31. *f.* 1. 1854.

SPECIMENS EXAMINED: Maui, *Hillebrand* B; Oahu, *Hillebrand* B; Kauai, *Van Ingen* C; Hawaiian Islands, *Baldwin* 29 C.

***Diellia laciniata*** (Hilleb.) comb. nov.

*Lindsaya laciniata* Hilleb. Fl. Haw. Is. 621. 1888.

TYPE LOCALITY: Halemanu, Kauai.

DISTRIBUTION: Known from type locality only.

ILLUSTRATION: Diels in E. & P. Nat. Pfl. 14: 211. *f.* 114E, F. 1899.

SPECIMENS EXAMINED: Halemanu, Kauai, *Knudsen* B.

*Hillebrand's*  $\beta$  variety *subbipinnata* has more symmetrical

pinnae than the type. His variety  $\gamma$ , as represented in the Berlin herbarium, is a monstrosity.

*DIELLIA KNUDSENII* (Hilleb.) Diels in E. & P. Nat. Pfl. **14**: 212, 1899

*Lindsaya Knudsenii* Hilleb. Fl. Haw. Is. 623. 1888.

TYPE LOCALITY: Halemanu, Kauai.

DISTRIBUTION: Known from Hawaiian Islands only.

ILLUSTRATIONS: Diels in E. & P. Nat. Pfl. **14**: 212. *f. 114L-N*. 1899.

SPECIMENS EXAMINED: Kauai, *Knudsen 19* (type) B.

***Diellia Mannii*** (Hilleb.) comb. nov.

*Microlepia Mannii* D. C. Eaton in Mann, Proc. Am. Acad. **7**: 212. 1867.

*Davallia Mannii* Baker in Hook. & Baker, Syn. Fil. ed. 2. 471. 1874.

*Lindsaya Mannii* Hilleb. Fl. Haw. Is. 624. 1888.

*Humata Mannii* Diels in E. & P. Nat. Pfl. **14**: 209. 1899.

TYPE LOCALITY: Kauai.

DISTRIBUTION: Hawaiian Islands.

SPECIMENS EXAMINED: Maui, *Bishop B*; Kauai, *Baldwin 10 B*, *C*; *Forbes 333 BM*; *Knudsen 38 B*; *Mann & Brigham 546 B*; Hawaiian Islands, *Baldwin V*.

10. **ODONTOLOMA** J. Sm. Jour. Bot. Hook. **3**: 415. 1841

Rootstock creeping, slender, scaly, much branching; leafstalk not articulate; blades membranaceous, dimidiate; veins forking, free or united in pairs at their apices; sori submarginal, discrete; indusium attached by a broad base, free laterally and apically, opening outward.

Type species: *Odontoloma pulchella* J. Sm.

**ODONTOLOMA MACRAEANUM** (Hook. & Arn.) Brack. Fil. U. S. Expl. Exp. 226. 1854

*Davallia Macraeana* Hook. & Arn. Bot. Beech. Voy. 108. 1832.

*Acrophorus repens* Moore, Ind. Fil. 91. 1857.

*Acrophorus Macraeanus* Carruth. in Seeman, Fl. Vit. 336. 1869.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Hawaiian Islands, common.

ILLUSTRATION: Hook. & Grev. Ic. Fil. *pl.* 143. 1829.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* C; Maui, *Baldwin* B; *Baldwin* 7 B; *Robinson* 203 V; 367 V; 369 V; Oahu, *Forbes* BM; (Honolulu) *Hillebrand* C; (Konahuanui) *Hillebrand* B; (Nuuanu) *Hillebrand* B; *Macrae* B; *Robinson* 163 V; 193 V; 613 V; *Wilkes Expedition* C; Kauai, *Robinson* 427 V; 433 V; 437 V; 499 V; *Remy* C; Hawaiian Islands, *Baldwin* B; *Gaudichaud* B; *Wilkes Expedition* B.

*Odontoloma Macracanum* differs from *Lindsaya repens* in that the sori are submarginal rather than marginal, as they are in the latter, and are discrete rather than confluent. Superficially they are much alike.

# 11. NEPHROLEPIS Schott, Gen. Fil. *pl.* 3. 1834

Terrestrial or epiphytic plants, mainly found in the tropics; rhizome creeping or suberect; leafstalk not articulate; blades pinnate, usually coriaceous, spreading or pendent; pinnae approximate, articulate; veins free, forked, each terminating in a punctiform apex, which bears a calcarous scale on the outer side; sori borne apically upon the upper branch of a vein, thus forming a single row parallel to the midrib; indusium circular or reniform.

Type species: *Nephrolepis exaltata* (L.) Schott.

Rootstock bearing tubers; indusium opening toward apex of pinna. *N. cordifolia*.

Rootstock without tubers; indusium opening obliquely toward margin of pinna.

*N. exaltata*.

\*NEPHROLEPIS CORDIFOLIA (L.) Presl, Tent. Pterid. 79. 1836

*Polypodium cordifolium* L. Sp. Pl. 1089. 1753.

*Aspidium cordifolium* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 32. 1801.

*Aspidium undulatum* Afz.; Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 32. 1801.

*Aspidium tuberosum* Bory in Willd. Sp. Pl. 5: 234. 1810.

*Nephrolepis tuberosa* Presl, Tent. Pterid. 79. 1836.

*Nephrolepis pendula* J. Sm. Jour. Bot. Hook. 4: 197. 1842.

TYPE LOCALITY: West Indies.

DISTRIBUTION: On ground and on trees; tropical countries, Japan, New Zealand.

ILLUSTRATIONS: Raddi, Pl. Bras. 1: *pl.* 46. 1825; Diels in E. & P. Nat. Pfl. 1<sup>1</sup>: 205. *f.* III. 1899.

SPECIMENS EXAMINED: Hawaii, *Robinson 225 V*; *Forbes 291 BM*.

Mr. J. F. Rock, botanist of the Forestry Station of the Hawaiian Department of Agriculture, reports having found *N. cordifolia* (L.) Presl [*N. tuberosa* (Bory) Presl] on Punaluu Trail above Kaliiuao, Oahu, on Mr. James Castle's place. He also says that he has specimens of the same plant in his herbarium, which were collected by Mr. Lyons, a missionary on the islands, about fifty years ago.

*N. cordifolia*, introduced into the Hawaiian Islands from Japan, is used as a border plant in gardens.

NEPHROLEPIS EXALTATA (L.) Schott, Gen. Fil. *pl.* 3. 1834  
*Polypodium exaltatum* L. Syst. ed. 10<sup>2</sup>: 1326. 1759.  
*Aspidium exaltatum* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 32. 1801.  
*Nephrodium exaltatum* R. Br. Prod. Fl. N. Holl. 148. 1810.  
*Aspidium Schkuhrii* Bl. Enum. Fil. Jav. 147. 1828.  
*Nephrolepis cultrifolia* Presl, Tent. Pterid. 79. 1836.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Epiphytic on trees; common in tropical countries.

ILLUSTRATIONS: Plumier, Fil. Am. *pl.* 63. 1703; Sloane, Hist. Jam. 1: *pl.* 31. 1707; Schkuhr, Krypt. Gew. *pl.* 32b. 1809 (not Mett. Fil. Hort. Lips. *pl.* 26. f. 1-5. 1856); Raddi, Pl. Bras. 1: *pl.* 46. 1825.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition C*; Maui, *Robinson 305 V*; Oahu, *Chamisso B*; *Heller 1987 C*; *Macrae B*; *Meyen B*; Kauai, *Heller 2873 C*; *Kuntze 23041 C*; *Robinson 6 V*; *154 V*; *423 V*; *425 V*; Hawaiian Islands, *Baldwin 73 C*; *Gaudichaud B, C*; *Miss Sessions C*.

## 12. ODONTOSORIA Presl, Tent. Pterid. 129. 1836

Rootstock short, creeping; leafstalks not articulate; blades 2-3-pinnate; ultimate divisions cuneate, usually truncate; veins simple or forked, if sterile, punctiform at the apex. Sori apical or sub-apical; indusium semiorbicular, attached at the base and sides, truncate at the apex.

Type species: *Davallia biflora* Kaulf.



ODONTOSORIA CHINENSIS J. Sm. Bot. Voy. Herald 430. 1857

*Trichomanes chinensis* L. Sp. Pl. 1099. 1753.

*Adiantum chusanum* L. Sp. Pl. 1095. 1753.

*Adiantum chinense* Burm. Fl. Ind. 236. 1768.

*Trichomanes cuneiforme* Forst. Prod. 330. 1786.

*Davallia chinensis* J. E. Sm. Mém. Acad. Turin 5: 414. 1793.

*Davallia chusana* Willd. Sp. Pl. 5: 414. 1793.

*Davallia tenuifolia* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 88. 1801.

*Adiantum tenuifolium* Poir. in Lam. Encyc. 1: 44. 1810.

*Davallia remota* Kaulf. Enum. 223. 1824.

*Microlepia tenuifolia* Mett. Fil. Lips. 104. 1856.

*Stenoloma tenuifolium* Fée, Gen. Fil. 330. 1852.

*Lindsaya chinensis* Mett. in Kuhn, Fil. Afr. 67. 1868.

TYPE LOCALITY: Bojei, Mauritius.

DISTRIBUTION: Tropical countries.

ILLUSTRATIONS: Mett. Fil. Lips. pl. 27. f. 1-4. 1856.

SPECIMENS EXAMINED: Hawaii, *Kuntze 1904 C*; *23089 C*; *Robinson V*; Maui, *Bailey C*; Oahu, *Capt. Haines B, C*; *Heller 2327 C*; *2328 C*; *Robinson 3 V*; *25 V*; *165 V*; *Knudsen 16 B*; *Wilkes Expedition 13 B*; Kauai, *Kuntze 23034 C*; Molokai, *Hillebrand B*; Hawaiian Islands, *Baldwin 11 B, C*; *Chamisso B*; *Gaudichaud B*; *Miss Sessions C*; *Wilkes Expedition C*.

### 13. MICROLEPIA Presl, Tent. Pterid. 124. 1836

Rootstock slender, creeping; leafstalk not articulate; blades various in size and texture; veins free, once or more than once forked; sori cup-shaped, upon a tooth or a sinus; indusium membranaceous, attached at sides and base, opening outward.

Type species: *Microlepia brasiliensis* Presl.

Leaf blade bipinnate, coriaceous, paleaceous.

*M. strigosa.*

Leaf blade tripinnate, chartaceous, glabrate.

*M. Speluncae.*

### MICROLEPIA STRIGOSA (Thunb.) Presl. Epim. 95. 1849

*Trichomanes strigosum* Thunb. Fl. Jap. 339. 1784.

*Dicksonia strigosa* Thunb. Trans. Linn. Soc. 2: 341. 1794.

*Dicksonia japonica* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 92. 1801.

*Davallia polypodioides* Don, Prod. Fl. Nepal. 10. 1825.

*Microlepia cristata* J. Sm. Jour. Bot. Hook. 3: 416. 1841.

*Davallia strigosa* (Sw.) Kunze, Bot. Zeit. 6: 542. 1848.

*Microlepia Khasiyana* Presl, Epim. 95. 1849.

*Microlepia japonica* Presl, Epim. 95. 1849.

*Davallia Khasiyana* Hook. Sp. Fil. 1: 173. 1856.

*Dennstaedtia strigosa* J. Sm. Hist. Fil. 265. 1875.

TYPE LOCALITY: Japan.

DISTRIBUTION: Tropics and subtropics, common.

ILLUSTRATIONS: Hook. Sp. Fil. 1: *pl.* 474, 574. 1856.

SPECIMENS EXAMINED: Hawaii, *Robinson 253 V*; *261 V*; Maui, *Baldwin B*; *Robinson 356 V*; Oahu, *Beechey C*; *Heller 2012 C*; *2327 C*; *Meyen B*; *Wilkes Expedition B, C*; Kauai, *Forbes 423 BM*; *Heller 2480 C*; *2803 C*; Molokai, *Hillebrand B*; Hawaiian Islands, *Baldwin 8 B, C*; *Miss Sessions C*.

The specimens vary as to the amount of pubescence, those collected in certain very moist localities, such as the Olao woods (*Robinson 253 V*, *261 V*), being much more furfuraceous than those collected in drier localities, as *Heller 2803*. The variation from narrowly to broadly lanceolate is not correlated with this, nor is there any correspondence in size with the greater size of *Microlepia hirta*, hence Hillebrand's variety *hirta* may be disregarded.

MICROLEPIA SPELUNCAE Moore, Ind. Fil. 93. 1857

*Polypodium Speluncae* L. Sp. Pl. 1093. 1753.

*Davallia flaccida* R. Br. Prod. Fl. N. Holl. 157. 1810.

*Aspidium Speluncae* Willd. Sp. Pl. 5: 269. 1810.

*Microlepia polypodioides* Presl, Tent. Pterid. 125. 1836.

*Microlepia flaccida* J. Sm. Jour. Bot. Hook. 1: 427. 1842.

*Davallia Speluncae* Baker in Hook. & Baker, Syn. Fil. 100. 1867.

TYPE LOCALITY: India.

DISTRIBUTION: Tropics and subtropics.

ILLUSTRATION: Pluk. Phytog. *pl.* 244. *f.* 2. 1692.

SPECIMENS EXAMINED: Hawaii, *Hillebrand B*; Maui, *Bailey C*; Oahu, *Heller 2072 C*; *Hillebrand B*; *Robinson V*; Kauai, *Heller 2650 C*; Hawaiian Islands, *Baldwin B, C*; *Miss Sessions C*.

14. VITTARIA J. E. Smith, Mém. Acad. Turin 5: 413. *pl.* 9. *f.* 5.

1793

Epiphytic plants of tropical regions; rootstock slender, creeping, scaly; leaves clustered, linear, grasslike, sessile or short-

stalked, articulate; veins anastomosing to form a single row of areolae on either side of the midvein; sorus upon a linear receptacle formed by a marginal or intramarginal groove on each side of the leaf, non-indusiate.

Type species: *Pteris lineata* L.

VITTARIA RIGIDA Kaulf. Enum. 193. 1824

TYPE LOCALITY: Oahu.

DISTRIBUTION: On trees, Polynesia.

SPECIMENS EXAMINED: Hawaii, *Robinson 204* V; *252* V; Oahu, *Chamisso* B; *Heller 2054* C; *2532* C; *Robinson 152* V; *521* V; *522* V; Kauai, *Kuntze 23039* C; Hawaiian Islands, *Baldwin 96* C; *Lindley* C; *Wilkes Expedition 3* C; *Moore* C.

This is the species wrongly referred by Hillebrand to *V. elongata* Sw. (Hilleb. Fl. Haw. Is. 551. 1888), the type of which is from India. In the Indian plants the ventral lip of the sorus is shorter than the lateral lip, so that the sporangia are invisible, and the leaves are nearly three times as long as those of the Hawaiian plants.

# 15. FILIX Adans. Fam. Pl. 20. 1763

Delicate rock ferns, found mainly in temperate regions. Rootstock short, erect; leaves clustered, not articulate; sori medial, subglobose; indusium attached by a broad base on the inner side, free above, soon reflexed.

Type species: *Polypodium bulbiferum* L.

**Filix Douglasii** (Hook.) comb. nov.

*Cystopteris Douglasii* Hook. Sp. Fil. 1: 200. 1846.

*Cystopteris sandwichensis* Brack. Fil. U. S. Expl. Exp. 234. 1854.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Hawaiian Islands.

ILLUSTRATION: Hook. Cent. Ferns pl. 55. 1854.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N, Herb. D. C. Eaton; Maui, *Wilkes Expedition* N; *Hillebrand* B; *Lichtenthaler* N; *Mann & Brigham* N; Oahu, *Hillebrand* B; Hawaiian Islands, *Baldwin* C; *Brackenridge* N.

16. CEROPTERIS Link, Fil. Sp. 141. 1841

Rootstock creeping or short oblique, covered with brown, linear-lanceolate scales; leaves cespitose; leafstalks not articulate; blades bipinnate to tripinnate, covered below with a waxy powder; veins free; sori following the course of the veins, non-indusiate.

Type species: *Acrostichum calomelanos* L.

Leaf blades bipinnate with a pinnatifid apex; powder on lower surface yellow.

*C. ochracea.*

Leaf blades tripinnate; powder on lower surface white.

*C. calomelanos.*

**Ceropteris ochracea** (Presl) comb. nov.

*Gymnogramme tartarea* var.  $\beta$  Hook. & Baker, Syn. Fil. 384. 1867.

TYPE LOCALITY: South America.

DISTRIBUTION: In moist thickets, tropical America, Costa Rica, Natal, and Hawaiian Islands.

SPECIMENS EXAMINED: Oahu, *Forbes* BM; *Robinson* V.

Mr. C. N. Forbes notes: "I find the species to be widely spread over the whole group (Hawaiian Islands), especially along the irrigation ditches. The golden variety is much less common than the silver."

This fern has been reported from the Philippines, where it has been thought to be an escape.

CEROPTERIS CALOMELANOS (L.) Link, Fil. Sp. 141. 1841.

(As *C. calomelaena*)

*Acrostichum calomelanos* L. Sp. Pl. 1072. 1753.

*Gymnogramma calomelanos* Kaulf. Enum. Fil. 76. 1824.

*Neurogramme calomelanos* Diels in E. & P. Nat. Pfl. 1<sup>4</sup>: 264. 1899.

TYPE LOCALITY: West Indies.

DISTRIBUTION: In open places, in wet ground, West Indies, South America, Hawaiian Islands.

ILLUSTRATIONS: Plumier, *Traité Foug. pl.* 40. 1705; Sloane *Hist. Jam. pl.* 30. f. 2. 1735.

SPECIMENS EXAMINED: Oahu, *Forbes* 1 BM; *Robinson* V.

17. CONIOGRAMME Fée, *Mém. Foug.* 5: 167. 1852

Mostly terrestrial plants. Rootstock creeping; leaves not articulate, pinnate or bipinnate, light green, glabrous, or slightly

pubescent beneath, chartaceous; veins free, 1-3-forked; sori linear, continuous upon the veins and forking with them, non-indusiate.

CONIOGRAMME FRAXINEA (Don) Diels in E. & P. Nat. Pfl. 1<sup>1</sup>: 262.  
1899

*Diplazium fraxineum* Don, Prod. Fl. Nepal. 12. 1825.

*Gymnogramme pilosa* Brack. Fil. U. S. Expl. Exp. 22. 1854.  
Not Mart. & Gal. 1842.

*Gymnogramme javanica* Hook. Syn. Fil. 381. 1867. Not Blume 1828.

TYPE LOCALITY: Nepal.

DISTRIBUTION: In wet woods at 900-1,200 m. elevation, Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. pl. 4. f. 1. 1854.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B; *Robinson* 200 V; *Wilkes Expedition* N; Maui, *Bishop* 68 B; *Hillebrand* B; *Mann & Brigham* 486 N; *Robinson* 314 V; 358 V; Oahu, *Robinson* 44 V; 53 V; Kauai, *Forbes* BM; *Heller* 2637 C, N; *Knudsen* 100 B; *Lichtenthaler* N; Hawaiian Islands, *Baldwin* 95 C, N; *Wilkes Expedition* N.

# 18. DRYOPTERIS Adans. Fam. Pl. 2: 20. 1763

Rootstock erect or creeping, usually short; leafstalk not articulate; blade pinnate to quadripinnate; veins free or those in adjacent lobes connate; sori round to elliptical; indusium, if present, usually reniform, with narrow sinus.

Type species: *Polypodium Filix-mas* L. Sp. Pl. 1090. 1753.

Veins free.

Indusium present.

Leaf blades bipinnatifid; basal pinnae reduced.

Under surface paleaceous with whitish hairs mingled with resinous dots.

*D. globulifera*.

Under surface densely covered, at least as to leafstalk and midribs, with linear-lanceolate, long-acuminate scales.

Blades coriaceous; scales light brown; veins more than once forking.

*D. paleacea*.

Blades chartaceous; scales dark brown; veins simple or once forking.

*D. fusco-atra*.

Leaf blades bipinnate to quadripinnatifid; basal pinnae not reduced.

- Under surface smooth.
  - Blades bipinnate above, tripinnatifid below, deltoid. *D. nuda.*
  - Blades tripinnate above, quadripinnatifid below, deltoid-ovate. *D. glabra.*
- Under surface glandular or scaly.
  - Under surface glandular.
    - Blades cordate-ovate (20-40 cm.  $\times$  16-32 cm.); sori marginal. *D. latifrons.*
    - Blades oblong-lanceolate (10-25 cm.  $\times$  4.5-8 cm.); sori medial. *D. parvula.*
  - Under surface scaly.
    - Blades bipinnate; paleaceous with light brown scales.
      - Leafstalk and midrib densely covered with ferruginous scales, leaf deltoid. *D. squamigera.*
      - Leafstalk and midrib sparsely covered with brown, membranaceous scales, leaf lanceolate. *D. hawaiiensis.*
    - Blades tripinnate; paleaceous with dark brown or black linear scales. *D. rubiginosa.*
- Indusium wanting.
  - Blades tripinnatifid to tripinnate.
    - Midribs covered with abundant dark fibrillose scales.
      - Blades coriaceous, punctate, with scattered resinous granules on their lower surfaces. *D. honolulensis.*
      - Blades chartaceous with no resinous granules. *D. crinalis.*
    - Midribs smooth or merely pubescent with whitish hairs.
      - Pinnules linear-lanceolate, acuminate, 1 cm. or more apart; leafstalk stramineous. *D. Keraudreniana.*
      - Pinnules oblong, obtuse, closely set; leafstalk reddish brown. *D. rubiformis.*
  - Blades quadripinnatifid to quadripinnate.
    - Ultimate segments sharply toothed, primary and secondary midribs purplish, scaly. *D. acutidens.*
    - Ultimate segments entire or with appressed teeth, midribs stramineous, smooth or fibrillose.
      - Basal scales of leafstalk mahogany-colored, spreading; sori submarginal. *D. unidentata.*
      - Basal scales of leafstalk pale, appressed; sori medial. *D. sandwicensis.*
- Veins connate.
  - Leaf blades pinnate, under surface covered with resinous glands; sori submarginal; indusium present. *D. propinqua.*

Leaf blades pinnate to bipinnatifid, under surface without resinous glands; sori variously placed; indusium present or wanting.

Indusium present.

Leaf blades bipinnatifid; basal pinnae reduced; under surface paleaceous with whitish hairs; sori medial upon secondary veins. *D. parasitica.*

Leaf blades pinnate; basal pinnae not reduced; under surface smooth; sori at base of secondary veins, forming a row on either side of primary veins. *D. cyatheoides.*

Indusium absent or fugacious.

Indusium absent; leaf blades pinnate; under surface hairy as to veins and sori. *D. stegnogrammoides.*

Indusium fugacious; leaf blades bipinnatifid; under surface not hairy. *D. truncata.*

DRYOPTERIS GLOBULIFERA (Brack.) Kuntze, Rev. Gen. Pl. 2: 812.

1891

*Lastraea globulifera* Brack. Fil. U. S. Expl. Exp. 194. 1854.

*Nephrodium globuliferum* Hook. Sp. Fil. 4: 96. 1862.

*Aspidium globuliferum* Hilleb. Fl. Haw. Is. 573. 1888.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: At elevations of 1,200–1,500 m., Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Robinson 607 V*; *Wilkes Expedition N*; *Hillebrand B, C*; Maui, *Bailey C*; *Bishop B*; *Hillebrand B*; Oahu, *Lichtenthaler N*; *Robinson 67 V*; *89 V*; *525 V*; Hawaiian Islands, *Baldwin 67 C, N*; *Gaudichaud B*; *Hillebrand C*; Kauai (var. *bipinnata*), *Hillebrand 53 B*.

***Dryopteris paleacea* (Sw.) comb. nov.**

*Aspidium paleaceum* Sw. Syn. Fil. 52. 1806.

*Aspidium parallelogrammum* Kunze, Linnaea 13: 146. 1839.

*Dichasium parallelogrammum* Fée, Mém. Foug. 5: 303. pl. 23. 1852.

*Lastraea truncata* Brack. Fil. U. S. Expl. Exp. 195. pl. 27. 1854.

TYPE LOCALITY: Peru, South America.

DISTRIBUTION: On ground at lower elevations; Mexico to Peru; Hawaiian Islands.

ILLUSTRATION: Fée, Mém. Foug. 5: pl. 23. 1852.

SPECIMENS EXAMINED: Hawaii, *Robinson 618 V*; *Wilkes Expe-*

dition; Maui, *Bailey* C; *Hillebrand* B; *Robinson* 385 V; Oahu, *Gaudichaud* B; *Lichtenthaler* N; Kauai, *Bishop* BM; *Forbes* 444 BM; *Heller* 2749 C, N; Hawaiian Islands, *Baldwin* 65 C, N.

*Dryopteris paleacea* is closely allied to the widely distributed *Dryopteris Filix-mas*, but the crowded pinnae, the truncate form of the pinnules, the form and number of the scales of the rachis distinguish it from the more lax and open form of the latter.

***Dryopteris fusco-atra* (Hilleb.) comb. nov.**

*Aspidium Filix-mas* var. *fusco-atrum* Hilleb. Fl. Haw. Is. 575. 1888.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: At high elevations, Hawaiian Islands.

ILLUSTRATION: PLATE 42.

SPECIMENS EXAMINED: Maui, *Hillebrand* 24 B; Oahu, *Forbes* BM; Kauai, *Bishop* B; *Heller* 2589 C, N; 2746 C; *Hillebrand* C; Hawaiian Islands, *Baldwin* B; *Hillebrand* 24 B; *Mann & Brigham* 255 N; *Miss Sessions* C.

The lax character of the leaves and the dark color of the scales are excellent field marks by which to distinguish this fern from *Dryopteris paleacea*.

DRYOPTERIS NUDA Underw. in *Heller*, Minn. Bot. Stud. 1: 780. 1896

*Aspidium glabrum* Hilleb. Fl. Haw. Is. 576. 1888. (Not Mett.)

TYPE LOCALITY: Kauai.

DISTRIBUTION: Hawaiian Islands.

ILLUSTRATION: PLATE 43.

SPECIMENS EXAMINED: Hawaii, *Robinson* 251 V; Maui, *Bishop* B; *Hillebrand* B; *Robinson* 335 V; 339 V; 393 V; Oahu, *Baldwin* B; *Hillebrand* B; *Robinson* 198 V; Kauai *Heller* 2750 (type) C; *Hillebrand* B; *Robinson* 818 V.

This fern strongly resembles *Dryopteris spinulosa* but is a much more compact, rigid form and has more acute ultimate divisions.

DRYOPTERIS GLABRA (Brack.) Kuntze, Rev. Gen. Pl. 2: 812. 1891

*Lastraea glabra* Brack. Fil. U. S. Expl. Exp. 200. 1854.

*Aspidium glabrum* Mett. Aspid. 59. 1858.

*Aspidium glabrum* var. *quadripinnatum* Hilleb. Fl. Haw. Is. 576. 1888.



TYPE LOCALITY: Hawaii.

DISTRIBUTION: High forests, Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; *Robinson* 268 V; 627 V; Maui, *Bailey* C; *Lindley* C; *Robinson* 374 V; 397 V; Oahu, *Halerman* 63 B; Kauai, *Robinson* 421 V.

Wilkes's specimen in the National Herbarium is labeled "sp. nov.," hence it is probably a cotype if not his type of Brackenridge's *Lastraea glabra*.

This is a much more graceful fern than *Dryopteris nuda*, which has been confused with it by some authors.

DRYOPTERIS LATIFRONS (Brack.) Kuntze, Rev. Gen. Pl. 2: 813.  
1891

*Lastraea latifrons* Brack. Fil. U. S. Expl. Exp. 196. 1854.

*Nephrodium latifrons* Hooker, Sp. Fil. 4: 138. 1862.

*Aspidium latifrons* Mann, Proc. Am. Acad. 7: 217. 1868.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Common at elevations of 600–1,200 m., Hawaiian Islands.

SPECIMENS EXAMINED: Maui, *Bailey* C; Lanai, *Hillebrand* B; Molokai, *Hillebrand* B; Oahu, *Forbes* 1082 BM; *Heller* 2899 C, N; *Lichtenthaler* N; *Mann & Brigham* 189, 195, 196 N; *Macrae* C; *Robinson* 93 V; 172 V; 182 V; *Wilkes Expedition* N; Hawaiian Islands, *Baldwin* 69 B, C, N; 129 B; *Gaudichaud* B; *Van Ingen* C; ex herb. Kew C; ex Herb. John Donnell Smith 623 N; 624 N.

***Dryopteris parvula* sp. nov.**

*Aspidium glabrum* var. *pusillum* Hilleb. Fl. Haw. Is. 577. 1888.

Not *Dryopteris pusilla* (Mett.) Kuntze.

Caudex short, oblique, covered with linear-lanceolate, light brown scales 7–10 mm. long; leafstalk slender, 6–7 cm. long, grooved ventrally; blade chartaceous, ovate-oblong, 12–20 cm. long, bipinnate; lobes of pinnae spinulose, marginal cells transparent; both surfaces of blade and stipe covered with globular glands; veins free, simple or once forking; sori borne dorsally on the veins; indusium reniform; sporangia biconvex; spores reniform, rugose.

TYPE LOCALITY: Kauai, at 1,600–2,000 m. elevation.

DISTRIBUTION: Hawaiian Islands.

ILLUSTRATION: PLATE 44.

SPECIMENS EXAMINED: Kauai, *E. Johnson* (type) B; Hawaiian Islands, *Hillebrand* C.

This very delicate fern is a miniature *Dryopteris glabra* (Brack.) Kuntze in form but is easily distinguished from this plant by its glandular exterior in addition to its small size.

DRYOPTERIS SQUAMIGERA (Hook. & Arn.) Kuntze, Rev. Gen. Pl. 2: 813. 1891

*Nephrodium squamigerum* Hook. & Arn. Bot. Beech. 106. 1832.

*Lastraea squamigera* Brack. Fil. U. S. Expl. Exp. 198. 1854.

*Aspidium squamigerum* Mann, Proc. Am. Acad. 7: 217. 1868.

TYPE LOCALITY: Kaala Mountains, Oahu.

DISTRIBUTION: At elevations of 600–1,200 m., Hawaiian Islands, Viti Islands, Society Islands; rare.

ILLUSTRATION: Hook. Sp. Fil. 4: 270. 1862.

SPECIMENS EXAMINED: Oahu, *Wilkes Expedition* N; Kauai, *Heller 2841* C, N; Lanai, *Lichtenthaler* N; Hawaiian Islands, *Baldwin 70* C, N.

***Dryopteris hawaiiensis* (Hilleb.) comb. nov.**

*Aspidium hawaiiense* Hilleb. Fl. Haw. Is. 575. 1888.

*Dryopteris Filix-mas* C. Chr. Ind. Fil. 265. 1905.

TYPE LOCALITY: Mauna Kea, Hawaii.

DISTRIBUTION: Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, Mauna Kea, *Hillebrand* (type) B; Hawaii, Hamakua, *Hillebrand* B; Maui, *Robinson 390* V; 395 V; Oahu, *Lichtenthaler* N; Hawaiian Islands, ex Herb. John Donnell Smith N.

DRYOPTERIS RUBIGINOSA (Brack.) Kuntze, Rev. Gen. Pl. 2: 813. 1891

*Lastraea rubiginosa* Brack. Fil. U. S. Expl. Exp. 201. 1854.

*Nephrodium rubiginosum* Hook. Sp. Fil. 4: 143. 1862.

*Aspidium rubiginosum* Mann, Proc. Am. Acad. 7: 217. 1868.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B; *Robinson 285* V; 621 V; *Wilkes Expedition* (type) N; Molokai, *Hillebrand* B;

*Lichtenthaler* N; Oahu, *Hillebrand* B; *Robinson* 136 V; *Safford* 909; Kauai, *Hillebrand* B.

*Dryopteris fijiense* (Hook.) C. Chr. is a closely related species but may be distinguished from *D. rubiginosa* (Brack.) Kuntze by its more open divisions, by the ciliated margin of its pinnules, and by its ciliated indusia, in contrast to the compact form and entire margins of the pinnules and indusia of *D. rubiginosa*. Compare Hook., A 2d Century of Ferns *pl.* 67. 1861; also Hook. Sp. Fil. 4: 143. 1862.

*DRYOPTERIS HONOLULENSIS* (Hook.) C. Chr. Ind. Fil. 271. 1905

*Polypodium honolulense* Hook. Sp. Fil. 4: 288. 1862.

*Polypodium Hillebrandii* Hook. Sp. Fil. 4: 254. 1862. (Not 4: 228. 1862.)

*Phegopteris honolulense* Mann, Proc. Am. Acad. 7: 218. 1867.

*Phegopteris Hillebrandii* Hilleb. Fl. Haw. Is. 366. 1888.

TYPE LOCALITY: Oahu.

DISTRIBUTION: On ground at elevations of 700–1,300 m., Hawaiian Islands.

SPECIMENS EXAMINED: Kauai, *Robinson* 383 V; Lanai, *Hillebrand* B, C; Molokai, *Hillebrand* B, C; Oahu, *Hillebrand* B, C; *Remy* B; *Robinson* 170 V; Kauai, *Hillebrand* B; *Robinson* 821; Hawaiian Islands, *Baldwin* 77 B, C; *Lydgate* B.

There is a strong superficial resemblance between *Dryopteris honolulensis* (Hook.) C. Chr. and *Dryopteris latifrons* Brack., but the small submarginal, naked sori distinguish the former.

*DRYOPTERIS CRINALIS* (Hook. & Arn.) C. Chr. Ind. Fil. 259. 1905

*Polypodium crinale* Hook. & Arn. Bot. Beech. 105. 1841.

*Phegopteris crinalis* Mann, Proc. Am. Acad. 7: 218. 1867.

TYPE LOCALITY: Oahu.

DISTRIBUTION: Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B, C; Molokai, *Hillebrand* B; Kauai, *Forbes* 269 BM; *Johnson* B; *Heller* 2587 C; *Robinson* 412 V; Hawaiian Islands, *Baldwin* 75 C; *Baldwin* B; *Baldwin* V.

Young specimens of *D. crinalis* are gray green in color, while mature specimens are rusty in appearance owing to the leathery texture and scaly under surface of the leaves.

DRYOPTERIS KERAUDRENIANA (Gaud.) C. Chr. Ind. Fil. 272.

1905

*Polypodium Keraudrenianum* Gaud. Voy. Freyc. Bot. 362. 1829.

*Phegopteris Keraudreniana* Mann, Proc. Am. Acad. 7: 218. 1867.

*Nephrodium Keraudrenianum* (Gaud.) Diels in E. & P. Nat. Pfl. 14: 177. 1899.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In forests, Hawaiian Islands.

ILLUSTRATION: Gaud. Voy. Freyc. Bot. pl. 7. 1829.

SPECIMENS EXAMINED: Hawaii, *Robinson* 336 V; *Wilkes Expedition* C; Maui, *Hillebrand* B; Molokai, *Hillebrand* B; Kauai, *Forbes* 96 BM; Hawaiian Islands, *Baldwin* 78 C; *Baldwin* V; *Gaudichaud* (type) B; *Hillebrand* B, C.

Although *Dryopteris Keraudreniana* and *Dryopteris rubiformis* are very similar in habit, they may be easily distinguished by the stramineous midrib and broad lanceolate pinnae of the former in contrast with the reddish midrib and narrow linear pinnae of the latter. Both support their weight by the attachment of the tips of the leaves to other plants, in a vinelike coil. If the leaf curves so that the end finally reaches the soil, it does not take root.

Hillebrand's variety *tripinnata* (Hilleb. Fl. Haw. Is. 562. 1888) has toothed segments in its pinnules, but this difference is too slight to warrant its separation from the species.

### ***Dryopteris rubiformis* nom. nov.**

*Polypodium procerum* Brack. Fil. U. S. Expl. Exp. 14. 1854. Not

*Dryopteris procera* (Baker) Kuntze.

*Phegopteris Keraudreniana* var. *procera* Hilleb. Fl. Haw. Is. 562. 1888.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In open places on the mountain sides, Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. pl. 3. 1854.

SPECIMENS EXAMINED: Maui, *Hillebrand* B; Kauai, *Robinson* 423 V; 829 V; Hawaiian Islands, *Baldwin* 94 C; *Wilkes Expedition* C.

The reddish stem and midrib of this fern, together with its tendency to curve and rest its weight upon other plants in a

thicket, suggest the appearance of blackberry vines by the roadside.

The type was collected upon the U. S. Exploring Expedition of 1854.

DRYOPTERIS ACUTIDENS C. Chr. Ind. Fil. 250. 1906

*Phegopteris spinulosa* Hilleb. Fl. Haw. Is. 566. 1888. Not

*Dryopteris spinulosa* (Müll.) Kuntze.

*Polypodium spinulosum* Baker, Ann. Bot. 5: 459. 1891.

TYPE LOCALITY: Southern slope of Haleakala, Maui.

DISTRIBUTION: Along banks of streams, at elevations of 400–1,400 m., Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B, C; Oahu, *Robinson* 177 V; Maui, *Hillebrand* B, C; *Robinson* 384 V; 604 V; 614 V; Kauai, *Heller* 2874 C; Hawaiian Islands, *Baldwin* 76 C; *Hillebrand* B; *Lydgate* B.

There is a marked superficial resemblance between *D. acutidens* C. Chr. and the North American *D. dilatata* (Hoffm.) A. Gray, but there is no trace of an indusial covering for the sorus in the youngest specimens of *D. acutidens*.

DRYOPTERIS UNIDENTATA (Hook. & Arn.) C. Chr. Ind. Fil. 299.  
1905

*Polypodium unidentatum* Hook. & Arn. Bot. Beech. 105. 1832.

*Phegopteris unidentata* J. Sm. Ferns Brit. & For. 170. 1866.

*Nephrodium unidentatum* Diels in E. & P. Nat. Pfl. 14: 174. 1899.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In forests at 600–1,200 m. elevation, Hawaiian Islands.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B; Maui, *Hillebrand* B, C; Molokai, *Hillebrand* B, C; Oahu, *Robinson* 194 V; Kauai, *Hillebrand* B, C; Hawaiian Islands, *Baldwin* 79 B, C; *Gaudichaud* B; *Hillebrand* B; *Baldwin* V.

*Hillebrand's* variety *paleacea* of this fern is apparently a form that has arisen from ecological causes rather than a stable variation; thus the tall habit and light color are characteristic of the plants growing in the deep forest at higher elevations than that of the dark green plants with short caudex.

DRYOPTERIS SANDWICENSIS (Hook. & Arn.) C. Chr. Ind. Fil. 290.  
1905

*Polypodium sandwicense* Hook. & Arn. Bot. Beech. 105. 1832.

*Phegopteris sandwicensis* Mann, Proc. Am. Acad. 7: 218. 1867.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: In forests, Hawaiian Islands, Viti Islands, and Pitcairn Island.

SPECIMENS EXAMINED: Hawaii, *Hillebrand* B; Maui, *Hillebrand* B; Lanai, *Hillebrand* B; Molokai, *Hillebrand* B, C; Oahu, *Hillebrand* B, C; Kauai, *Heller* 2838 C; *Hillebrand* 66 B; Hawaiian Islands, *Baldwin* 79a B; *Hillebrand* B; *Knudsen* 158 B; 159 B; 160 B; *Lydgate* B.

DRYOPTERIS PROPINQUA (R. Br.) Gilb. Bull. Torrey Club 23: 454.  
1896

*Aspidium unitum* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 32. 1801. Not

*Dryopteris unita* (L.) Kuntze.

*Nephrodium propinquum* R. Br. Prod. Fl. N. Holl. 148. 1810.

*Aspidium resiniferum* Kaulf. Enum. 237. 1824.

*Aspidium propinquum* Sw. Adnot. 67. 1829.

*Nephrodium resiniferum* Hook. & Arn. Bot. Beech. 105. 1832.

*Aspidium Ecklonii* Kunze, Linnaea 10: 546. 1836.

*Nephrodium Ecklonii* Presl, Epim. 49. 1849.

TYPE LOCALITY: Australia.

DISTRIBUTION: Very common in swamps in tropical countries.

ILLUSTRATION: Schkuhr, Krypt. Gew. pl. 33b. 1809.

SPECIMENS EXAMINED: Oahu, *Beechey* C; *Robinson* 90 V; Maui, *E. Bailey* C; Kauai, *Forbes* 37 BM; *Heller* 2594 C; *Robinson* 465 V; 467 V; 474 V; Hawaiian Islands, *Baldwin* 66 B, C; *Gulick* B; *Hillebrand* B.

*Dryopteris propinqua* has caused much confusion because certain transitory characters, such as the hairs on the surface of the leaf and at the margin of the indusium, have been considered as specific.

This species is rarely in fruit though it grows abundantly in the roadside ditches from sea level to 1,500 m. elevation.

DRYOPTERIS PARASITICA (L.) Kuntze, Rev. Gen. Pl. 2: 811. 1891

*Polypodium parasiticum* L. Sp. Pl. 1090. 1753.

- Polypodium dentatum* Forsk. Fl. Aeg.-arab. 185. 1775.  
*Polypodium nymphale* Forst. Prod. 81. 1786.  
*Polypodium molle* Jacq. Coll. Bot. 3: 188. 1789. (Not Schreb. 1771 nor All. 1785.)  
*Aspidium molle* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 34. 1801.  
*Aspidium parasiticum* Sw. Jour. Bot. Schrad. 1800<sup>2</sup>: 35. 1801.  
*Aspidium patens* Sw. Jour. Bot. Schrad. 1801<sup>1</sup>: 280. 1803.  
*Aspidium nymphale* Schkuhr, Krypt. Gew. 1: 36. pl. 34. 1806.  
*Nephrodium molle* R. Br. Prod. Fl. N. Holl. 149. 1810.  
*Nephrodium parasiticum* Desv. Mém. Soc. Linn. 6: 258. 1827.  
*Nephrodium nymphale* Desv. Mém. Soc. Linn. 6: 258. 1827.  
*Polystichum molle* Gaud. Voy. Freyc. Bot. 326. 1828.  
*Aspidium violascens* Link, Hort. Berol. 2: 115. 1833.  
*Nephrodium violascens* Fée, Mém. Foug. 5: 305. 1852.

TYPE LOCALITY: India.

DISTRIBUTION: In open places between 1,400–1,600 m. elevation. Tropics, subtropics, and New Zealand.

ILLUSTRATIONS: Rheede, Hist. Hort. Malab. 12: 17. 1753; Schkuhr, Krypt. Gew. pl. 34. 1806.

SPECIMENS EXAMINED: Hawaii, *Robinson 223 V*; Oahu, *Heller 2011 C*; *Robinson 170 V*; *188 V*; *192 V*; Kauai, *Robinson 800 V*; *805 V*; *811 V*.

There is a marked superficial resemblance between *Dryopteris parasitica* and *D. globulifera*, but the former is distinguished by its hairy epidermis and indusia in addition to the short lobes of its pinnae, while the latter has glands upon its epidermis and indusia, and its pinnae are deeply cut.

DRYOPTERIS CYATHEOIDES (Kaulf.) Kuntze, Rev. Gen. Pl. 2: 812. 1891

- Aspidium cyatheoides* Kaulf. Enum. Fil. 234. 1824.  
*Polystichum Dubrueilianum* Gaud. Freyc. Voy. Bot. 333. 1828.  
*Nephrodium Dubrueilianum* Hook. & Arn. Bot. Beech. 105. 1832.  
*Nephrodium cyatheoides* Presl, Tent. Pterid. 81. 1836.  
*Aspidium cyatheoides* Mett. Aspid. 110. 1858.

TYPE LOCALITY: Oahu.

DISTRIBUTION: On ground in the lower forests and along rivers, Hawaiian Islands, New Guinea, Sumatra.

ILLUSTRATIONS: Gaud. Voy. Freyc. Bot. *pl.* 9. 1828; Presl, Tent. Pterid. *pl.* 2. f. 5. 1836; Hook. Sp. Fil. 4: *pl.* 241. 1862.

SPECIMENS EXAMINED: Hawaii, *Robinson* 232 V; *Wilkes Expedition* C; Molokai, *Hillebrand* B; Oahu, *Anderson* B; *Bennett* 11 B; *Bennett* B; *Chamisso* B; *Heller* 1991 C, N; *Lichtenthaler* N; *Macrae* B; *Meyen* B; *Remy* 13 C; *Robinson* 21 V; *Wilkes Expedition* N; Kauai, *Heller* 2857 C; *Hillebrand* 85 B; 87 B; *Mann & Brigham* 152 N; *Wilkes Expedition* N; Hawaiian Islands, *Baldwin* B, C; 63 C; *Beechey* C; *Wilkes Expedition* C; *Gaudichaud* B; *Lindley* C; *Miss Sessions* C; *Wilkes Expedition* B; ex herb. Kew Gardens 2 specimens C.

The tips of young leaves of this fern are eaten by the Hawaiian natives as a salad.

There is an interesting superficial resemblance between *Dryopteris cyatheoides* and *D. stegnogrammoides*.

DRYOPTERIS STEGNOGRAMMOIDES (Baker) C. Chr. Ind. Fil. 294. 1905

*Polypodium polycarpon* Hook. & Arn. Bot. Beech. 104. 1832. Not Swartz.

*Stegnogramma sandwicense* Brack. Fil. U. S. Expl. Exp. 26. *pl.* 4. 1854. Not *Dryopteris sandwicensis* C. Chr.

*Polypodium sandwicense* Hook. Sp. Fil. 5: 5. 1864. (Not 4: 267. 1862.)

*Polypodium stegnogrammoides* Baker, Syn. Fil. 317. 1867.

*Phegopteris microdendron* D. C. Eaton in Mann, Proc. Am. Acad. 7: 218. 1867.

*Nephrodium polycarpon* Diels in E. & P. Nat. Pfl. 14: 179. 1899.

TYPE LOCALITY: Hawaiian Islands.

DISTRIBUTION: Hawaiian Islands.

ILLUSTRATION: Brack. Fil. U. S. Expl. Exp. *pl.* 4. 1854.

SPECIMENS EXAMINED: Hawaii, *Robinson* 617 V; Molokai, *Hillebrand* B; *Lindley* C; *Macrae* B; Kauai, *Forbes* 239 BM; Hawaiian Islands, *Baldwin* B; *Gaudichaud* B.

*Hillebrand* (Fil. Haw. Is. 560. 1888) describes the caudex of *Dryopteris stegnogrammoides* as erect, but the specimens collected by the writer had prostrate rootstocks. His variety *depauperata* probably owes its decreased size and pubescence to its exposed



situation upon the rocks, a theory which seems the more tenable from his statement that a corresponding form of *Dryopteris cyatheoides* is associated with this variety of *D. stegnogrammoides* in such localities.

DRYOPTERIS TRUNCATA (Poir.) Kuntze, Rev. Gen. Pl. 2: 814.  
1891

*Polystichum truncatum* Gaud. Voy. Freyc. Bot. 332. *pl.* 10. 1828.

*Nephrodium truncatum* Presl, Tent. Pterid. 81. 1836.

*Nephrodium Hudsonianum* Brack. U. S. Expl. Exp. 189. *pl.* 25.  
1854.

*Aspidium Hudsonianum* Mann, Proc. Am. Acad. 7: 217. 1867.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Malaysia, Polynesia, Ceylon, Northern India, Brazil.

ILLUSTRATIONS: Gaud. Voy. Freyc. Bot. *pl.* 10. 1828; Brack. Fil. U. S. Expl. Exp. *pl.* 25. 1854.

SPECIMENS EXAMINED: Hawaii, *Wilkes Expedition* N; Oahu, *Heller* 2334 C, N; *Mann & Brigham* N; *Robinson* 152 V; 192 V; 522 V; 523 V; *Safford* 869 N; 870 N; Maui, *Bailey* C; Kauai, *Heller* 2843 C, N; *Hillebrand* B; Hawaiian Islands, *Baldwin* 64 B; C; 65 B; (*Baldwin*) V; *Gaudichaud* B.

Poiret gives the habitat of *Dryopteris truncata* as Brazil. Baker (Syn. Fil. 295. 1874) gives a range of distribution through the subtropics, which Christensen follows. The representation of this genus in the herbarium of the New York Botanical Garden does not indicate that this is so cosmopolitan a species.